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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/086,043	02/28/2002	S. Mark Haugland	PAT009US	8887

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W-H ENERGY SERVICES, INC.  
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HOUSTON, TX 77042

EXAMINER
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ORTIZ RODRIGUEZ, CARLOS R

ART UNIT	PAPER NUMBER
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2125

MAIL DATE	DELIVERY MODE
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09/11/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

80

<b>Office Action Summary</b>	<b>Application No.</b> 10/086,043	<b>Applicant(s)</b> HAUGLAND, S. MARK	
	<b>Examiner</b> Carlos Ortiz-Rodriguez	<b>Art Unit</b> 2125	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 11 June 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 30-76 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 30-76 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Arguments*

1. Claims 1-29 are cancelled.
2. Applicant's arguments have been fully considered but they are not persuasive. Applicant amended claims in order to overcome the 35 U.S.C. 112 rejections, therefore said rejections have been withdrawn. The previous rejection under 35 U.S.C. 102 is maintained.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 30-76 are rejected under 35 U.S.C. 102 (b) as being anticipated by Clark et al. U.S. Patent No. 4,968,940.

Regarding claims 30, 44, 45, 54, 62, 63, 65, 66, 71, 72 and 73, Clark et al. discloses estimating (i) at least one of first and second electrical parameters and (ii) a spatial coordinate of a boundary separating first and second regions in a heterogeneous subterranean formation, the method comprising:

(a) obtaining a plurality of measured electrical signals that have penetrated the heterogeneous subterranean formation, the electrical signals representative of properties of the subterranean formation (C6 L54-68);

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(b) comparing said measured electrical signals to a model that estimates said measured electrical signals as a function of the first electrical parameter, the second electrical parameter, and the spatial coordinate (C12 L9-57); and

(c) assigning a value to the first electrical parameter and the spatial coordinate such that the model generates estimated electrical signals that are substantially equal to the measured electrical signals, wherein said assigned value for the first electrical parameter is substantially insensitive to the second electrical parameter (C12 L23-27).

Regarding claim 31, Clark et al. discloses wherein (c) further comprises assigning a value to the second electrical parameter (C12 L23-27).

Regarding claim 32, Clark et al. discloses (d) transforming the second electrical parameter into a variable that depends on the first electrical parameter (Equation (5c)).

Regarding claims 33, 46 56 and 68, Clark et al. discloses the first electrical parameter comprises a resistivity and the second electrical parameter comprises a dielectric constant (C12 L60-65 and C13 L1-55).

Regarding claim 34, Clark et al. discloses the second electrical parameter comprises a resistivity and the first electrical parameter comprises a dielectric constant (C13 L33-68 and C14 L1-20).

Regarding claims 35, 47, 57, 69 and 70, Clark et al. discloses the measured electrical signals include an attenuation measurement and a phase shift measurement (C6 L42-53).

Regarding claims 36 and 48, Clark et al. discloses wherein: the model is a transformation that maps the first and second electrical parameters and the spatial coordinate to a vector representative of the measured electrical signals (C12 L9-57); and (c) further comprises applying an inverse of the transformation to the measured electrical signals (C10 L67-68).

Regarding claims 37, 49 and 61, Clark et al. discloses wherein (c) further comprises applying a first mathematical transformation to the measured electrical signals and a second mathematical transformation to the estimated electrical signals generated by the model (C12 L18-44).

Regarding claims 38, Clark et al. discloses wherein the first mathematical transformation yields a result that is sensitive to the first electrical parameter and relatively insensitive to the second electrical parameter (C12 L39-51).

Regarding claims 39, Clark et al. discloses wherein the second mathematical transformation yields a result that is sensitive to the first electrical parameter and relatively insensitive to the second electrical parameter (C12 L39-51).

Regarding claims 40, 50, 58 and 75, Clark et al. discloses (c) further comprises assigning values to the first electrical parameter in each of the first and second regions (C11 L45-51).

Regarding claims 41, 51, 59 and 76, Clark et al. discloses wherein the first region comprises an invaded zone, the second region comprises essentially virgin formation, and the spatial coordinate comprises a radius of the invaded zone (C19 L40-64).

Regarding claims 42, 52, 60 and 74, Clark et al. discloses wherein (a) further comprises obtaining the plurality of measured electrical signals at each of a plurality of frequencies (C15 L45-47).

Regarding claims 43 and 53, Clark et al. discloses wherein (c) further comprises assigning distinct values to the first electrical parameter at each of the plurality of frequencies (C15 L45-47).

Regarding claim 55, Clark et al. discloses estimating (i) at least one of first and second electrical parameters and (ii) a spatial coordinate of a boundary separating first and second regions in a heterogeneous subterranean formation, the method comprising:

- (a) obtaining a plurality of measured electrical signals that have penetrated the subterranean formation, the electrical signals representative of properties of the subterranean formation (C6 L54-58);
- (b) evaluating a model to obtain estimated electrical signals as a function of the first electrical parameter and the spatial coordinate (C12 L9-57);
- (c) applying a first mathematical transformation to the measured electrical signals to obtain a first result, the first result being sensitive to the first electrical parameter and relatively insensitive to the second electrical parameter;

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(d) applying a second mathematical transformation to the estimated electrical signals to obtain a second result, the second result being sensitive to the first electrical parameter and insensitive to the second electrical parameter (C12 L18-51) ; and

(e) assigning values to the first electrical parameter and the spatial coordinate such that the first result obtained in (c) and the second result obtained in (d) are substantially equal (C12 L23-27).

Regarding claims 64 and 67 Clark et al. discloses the first mathematical transformation is identical to the second mathematical transformation (C10 L67-68 and C12 L18-44).

*Conclusion*

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carlos Ortiz-Rodriguez whose telephone number is 571-272-3766.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached on 571-272-3749. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

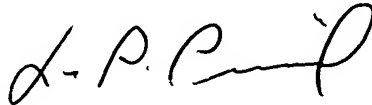


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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Carlos Ortiz-Rodriguez  
Patent Examiner  
Art Unit 2125

September 4, 2007



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SUPERVISORY PATENT EXAMINER  
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